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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/545,549	04/07/2000	Tomoyuki Hirano	P00,0253	1881

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EXAMINER

GOUDREAU, GEORGE A

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 07/16/2003

12

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09-545549

Applicant(s)

Hirano et al

Examiner

George Goudreau

Group Art Unit

1763

— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address —

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

☒ Responsive to communication(s) filed on 4-22-03 (re-papers #10-11)

☒ This action is FINAL.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

☒ Claim(s) 1, 3-16 is/are pending in the application.

Of the above claim(s) 3 is/are withdrawn from consideration.

☒ Claim(s) 1, 15-16 is/are allowed.

☒ Claim(s) 4-14 is/are rejected.

☐ Claim(s) is/are objected to.

☐ Claim(s) are subject to restriction or election requirement

Application Papers

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

☐ All ☐ Some* ☐ None of the:

☐ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. _____

☐ Copies of the certified copies of the priority documents have been received

in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____

Attachment(s)

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☒ Notice of Reference(s) Cited, PTO-892

☐ Notice of Informal Patent Application, PTO-152

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Other _____

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15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

17. Claims 4, and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto (6,413,833) as applied in paragraph 16 of the previous office action further in view of Figura et. al. (6,355,536).

Yamamoto as applied in paragraph 16 of the previous office action fails to disclose the following aspects of applicant's claimed invention:

-the specific usage of the types of wet etchants which are claimed by the applicant to wet etch the phosphorus doped amorphous Si layer used in the construction of the DRAM

Figura et. al. teach that it is desirable to roughen the surface of a phosphorus doped amorphous silicon layer which is used in the construction of a DRAM by etching it using an

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alkaline wet etchant such as any of tetramethylammonium hydroxide, KOH, NH₄OH, or NaOH.

This is discussed specifically in columns 5, 9-12; and discussed in general in columns 1-12. This is shown in figures 1-19.

It would have been obvious to one skilled in the art to employ any of a variety of different types of alkaline etchants including those which are specifically claimed by the applicant to wet etch the phosphorus doped amorphous Si layer in the process taught by Yamamoto based upon the teachings of Figura et. al. that it is desirable to do so. Further, it would have been desirable to use the wet etching process taught by Figura et. al. to desirably roughen the surface of the phosphorus doped amorphous Si layer in order to increase the surface area of the plates in the DRAM made by Yamamoto. This would desirably result in an increase in the amount of memory which the DRAM made by Yamamoto could have. Further, Figura et. al. generically teaches that it is possible to use an alkaline wet etchant to roughen the phosphorus doped amorphous Si layer. Figura et. al. further teach the specific usage of a large variety of different alkaline wet etchants which may be used to roughen the surface of the phosphorus doped amorphous Si layer. This would seem to suggest that any alkaline wet etchant including one which contains hydroxylamine would be suitable for roughening the surface of the phosphorus doped amorphous Si layer.

18. Claims 1, and 15-16 are allowed.

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19. Claims 5-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

-The wording used in claims 5-6 is confusing, and should be reworded. (What inter-layer insulating film is applicant referring to in these claims. This term appears to lack proper antecedent basis in the claims upon which these claims depend.); and

-Claim 7 appears to conflict upon claim 5 upon which it depends. Claim 8 appears to conflict with claim 6 upon which it depends. (In both claims 7-8, it is recited that the etching stopper layer is formed on the contact electrode while in claims 5-6 upon which these claims depend, it is recited that the etching stopper layer is formed on the inter-layer insulating film. Is the inter-layer insulating film the same film as the etching stopper layer? Can applicant clarify the claim language in this regard?)

20. Applicant's arguments filed 4-22-03' have been fully considered but they are not persuasive.

Applicant argues the following points regarding the examiner's rejection of their claimed subject matter.

-Applicant argues that the newly amended claims can no longer be rejected under 102.

Applicant further argues that the newly amended claims cannot be rejected under 103 either since it is not obvious to one skilled in the art to employ the wet etchant claimed by the applicant to conduct the fourth etching step which is claimed by the applicant.

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The examiner must disagree.

-The examiner has now rejected applicant's claimed subject matter under 103 since applicant has amended their claims to overcome the previous 102 rejection of their claimed subject matter. Further, there is suitable motivation to conduct applicant's claimed etching process using applicant's claimed wet etchant for their fourth etching step based upon the teachings of the newly applied Figura et. al. reference. Further, Figura et. al. is directed to the same endeavor as that of the primary reference used to reject applicant's claims (i.e.-Yamamoto) rendering it further obvious to combine the teachings of these two references.

21. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner George A. Goudreau whose telephone number is (703) -308-1915. The examiner can normally be reached on Monday through Friday from 9:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Examiner Gregory Mills, can be reached on (703) -308-1633. The appropriate fax phone number for the organization where this application or proceeding is assigned is (703) -306-3186.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) -308-0661.



George A. Goudreau/gag

Primary Examiner

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